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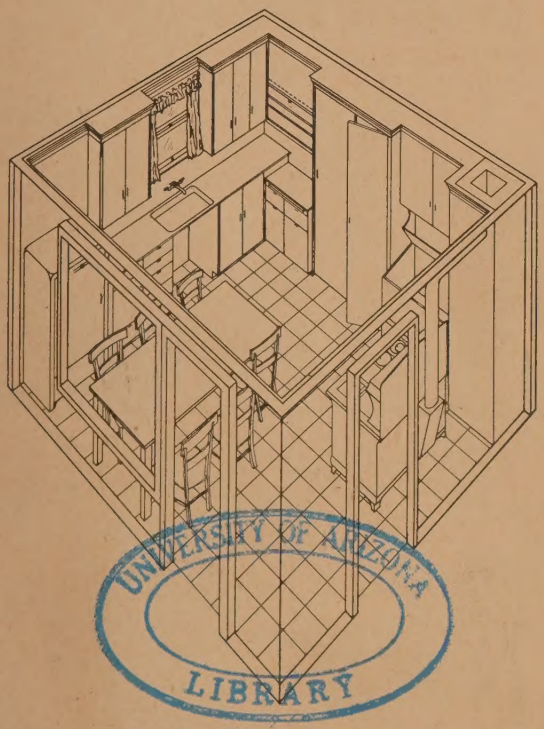
# Planning the Kitchen

By

MAUD WILSON



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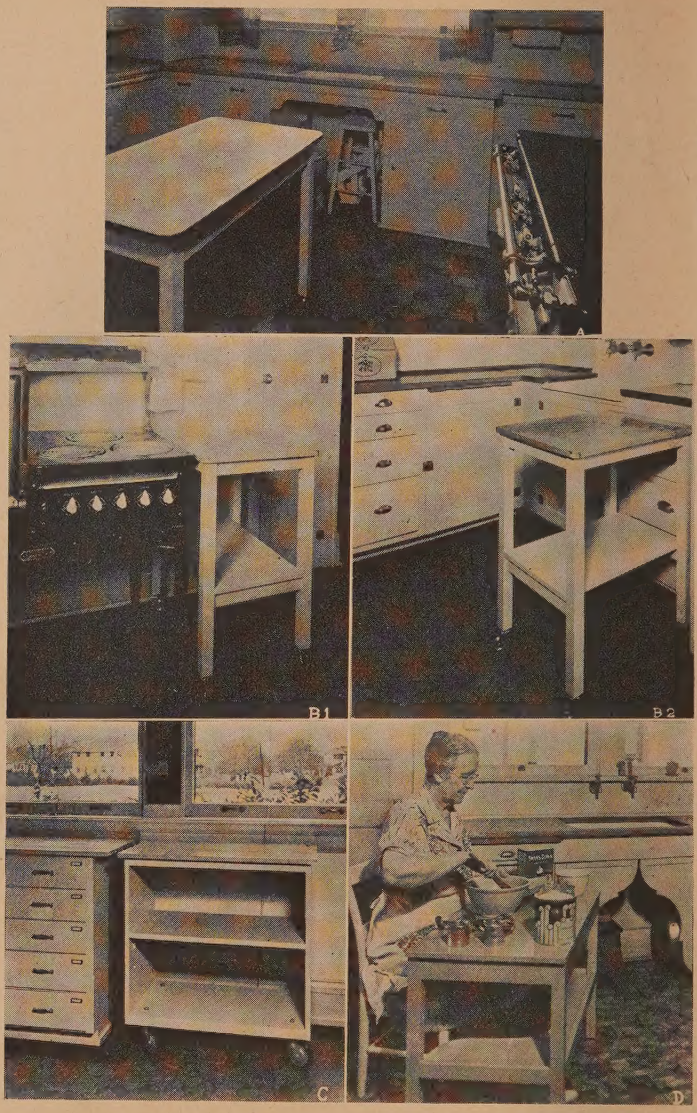


Figure 1. Four kitchens made more convenient by adding movable tables.

(A) Distances in a large kitchen shortened by the installation of a work table on casters.
(B) A zinc-covered table top does double duty: (1) it is used to enlarge the surface of an inadequate stove top, (2) it increases the length of the sink work counter.
(C) A portion of the sink work counter is made movable, and used in the center of the room when desired.
(D) A lap table makes it possible for the homemaker to be seated while preparing meals.

# Planning the Kitchen

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WHEN the farm family embarks upon the venture of remodeling a kitchen or planning a new one, it is confronted with the problem of deciding what built-in cabinets are needed, what arrangement of the kitchen is desirable, and what size the room needs to be. As an aid in making these decisions, a study has been completed at Oregon State College in which detailed kitchen plans were developed for representative Willamette Valley farm families. The major conclusions from this study are set forth in this circular. They include (1) desirable procedure in planning the kitchen, (2) minimum and average dimensions for storage and work space, (3) designs for cabinets, (4) step-saving room arrangements.*

## FARM KITCHENS HAVE MANY USES

The secret of convenience in a kitchen is adequate provision for *all* of the uses it must serve. The first step in planning the kitchen, then, is to list all of its uses. Customarily these include food preparation, cooking, and dishwashing. The majority of farm families like to have space to eat in the kitchen, even when there is a dining room. Whether meals are served there or not, the average household wants a "family" center where children can play or adults can rest or sit at work. Many homemakers prefer to iron in the kitchen.

There are certain other needs for which provision in the farm kitchen may be necessary. In the study on which this circular is based, it was assumed that there would be space outside the kitchen for packing eggs, caring for milk, making butter, washing clothes, drying wet garments, hanging chore clothes, storing cleaning equipment, and storing equipment not frequently used. If provision outside the kitchen is not made for any of these activities or storage requirements, space in the kitchen should be specifically planned.

The mechanical equipment of the house is another factor that influences the kitchen plan. The conclusions from this study apply to the situation where electricity and piped hot and cold water are available.

## A PLACE FOR EVERYTHING

It is easy to keep the kitchen in order if utensils and supplies can be kept near the place where they are most often used. In order to plan cabi-

* Further information concerning this study is contained in Oregon Station Bulletin 356, *The Willamette Valley Farm Kitchen,* of which this circular is an abstract.

nets with this goal in mind, it is necessary to group the various uses of the kitchen into units, or centers. Following is a description of the units needed in the average farm kitchen for work with foods.

**Sink center**

Sink proper—for processes requiring water or draining.

Counter space—for receiving soiled dishes, stacking, and draining, and for handling foods that require washing.

Place for garbage container; stool.

Storage space for dishpans and drainer; dishwashing supplies and small equipment; towels in use; clean towels; cooking vessels, pans, strainers; small equipment used in the preparation of foods at the sink; supplies of foods requiring soaking or washing; vegetable cutting board.

Storage space for glasses used for between-meal drinks of water, flower containers, empty fruit jars (until taken to storeroom), milk utensils, and medicines and first aid equipment also may be desired at the sink.

**Serving center**

Surface for cutting bread, filling dishes for table, etc.

Storage space for bread, cake, cookies, crackers, ready-to-eat cereals, and other foods requiring no preparation for the table; cutlery used in serving; bread board; dishes, silver, and table linen; serving mats and trays; and table decorations.

**Mixing center**

Table where bread, pastry, etc., are prepared.

Storage space for flour, meal, and other uncooked cereals used mainly in preparing made dishes; sugar; leavening agents and flavorings; dried fruits used in cooking and not requiring washing or soaking; utensils used in making bread, pastries, casserole dishes, etc.; pastry and meat boards; recipes; scales; and equipment used in packing lunches.

**Stove center**

Stove proper—heated surface, oven, warming oven, or shelf.

Adjacent work area or unheated surface where short mixing jobs can be done.

Storage space for uncooked cereals used for porridge; coffee and tea; seasonings; skillets; roasters; coffee pot, teapot; pressure cooker; steamer; utensils used in tending foods at stove; fuel and kindling.

**Draft cooler; refrigerator**

An important decision the kitchen planner must make is whether or not to allow space for a refrigerator. In view of the outlook for decreased cost of power and appliances, it was deemed wise in planning the kitchens included in this study to provide floor and wall space for mechanical refrigerators, but also to provide draft coolers large enough for all perishable foods.

**Movable work table, lap table, and work chair**

In planning a kitchen it is sometimes difficult to develop a satisfactory arrangement because the available floor space is too wide, or because wall spaces for built-ins are too short. In many such instances the solution to the problem is to provide a movable work table. Figure 1 illustrates designs and uses for wheeled work tables.

A new idea in kitchen planning is the "lap" table, which is a small table or pull-out board just high enough to slip over the worker's thighs when

she is seated with both feet on the floor. This table is particularly useful at periods when the worker needs to be off her feet as much as possible. It may be used for ironing or sewing as well as for food preparation. (See Figure 1D)

Several uses of the kitchen can be combined to form the "family" center, because the same table can be used for dining, child's play, writing, and for sorting and piling garments while ironing. Following are the arrangements needed for each of these functions:

**Dining**

Meal table and chairs.
Near-by surface for placing tray.
Storage space for silver and linen, electrical appliances used at meal table, and articles not requiring washing or filling after each meal (as salt shakers, sugar bowl).

**Planning**

Table or desk where writing can be done.
Shelves for books, bulletins, and files.
Drawers for business papers and pamphlets.

**Ironing**

Ironing board.
Table for sorting and laying flat articles.
Place for garments on hangers.
Storage for iron and other equipment.

**Child care and play**

Table and at least two chairs.
Storage for child's playthings.
Space for child's high chair.

There remain a few articles for which room should be provided, but which can be assigned to any space that is convenient. These include rack for drying wet towels, waste paper basket, articles used in preparing child's food, articles used in feeding child in kitchen, unopened canned goods, kitchen aprons in use, clean aprons, clean rags, and stepping stool for reaching high shelves.

## DESIGNS FOR CABINETS

### Sink and serving centers

The sink center is considered jointly with the serving center because it is often advantageous to build a cabinet serving both uses. Activities centering about the sink require work surfaces on both sides, and in a well-managed farm kitchen one of these surfaces is usually free for use as a serving table at the time it is needed for that purpose.

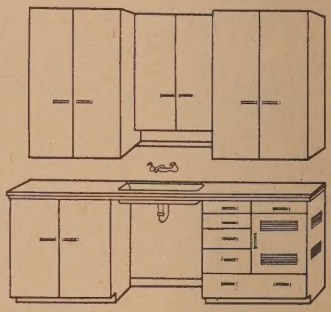
Figure 2 shows designs for cabinets that combine the sink and serving centers. Detailed drawings of various parts of these cabinets are given in Figures 3, 4, 5, and 6. Some conclusions concerning dimensions of cabinets of the type shown in Figure 2 are these:

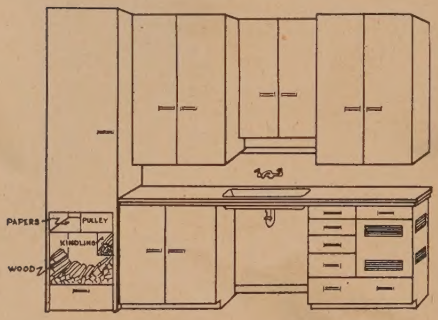
| | |
|---|---|
| Desirable width of work counter (front to back) | 24″ |
| Desirable length of sink bowl* | 30″ |

* A one-compartment sink of this length permits the handling of utensils of the sizes used by the majority of cooperators, and both a dishpan and a rinse pan can be placed in it. This length also permits the installation of a two-compartment sink, which is a satisfactory type for the farm kitchen if there is a sink outside the kitchen to use for washing large articles, such as milk cans.

| | |
|---|---|
| Minimum length of counter at left of sink | 32″ |
| Minimum length of counter at right of sink | 36″ |
| Minimum length of sink cabinet supplying adequate counter space | 8′2″ |
| Minimum (and desirable) space between upper and lower cabinets | 12″ |
| Minimum (and desirable) inside width of upper cabinets | 11″ |
| Minimum (and desirable) depth of cabinet above sink bowl | 4″ |

(A). PROVIDES FOR STORAGE OF ALL EQUIPMENT ALLOCATED TO THE SINK AND SERVING CENTERS. RIGHT AND LEFT SECTIONS MADE EQUAL IN LENGTH. CABINET DIRECTLY ABOVE SINK.






(B). SINK-AND-SERVING CENTER WITH ADJACENT WOOD LIFT

(C). RACKS ON BOTH SIDES OF SINK FOR TOWELS AND SINK SUPPLIES

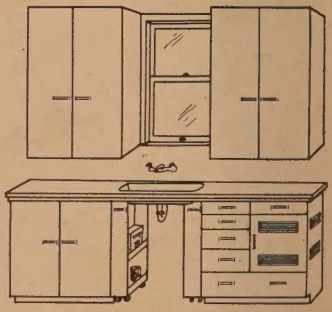


Figure 2. Variations in the design of cabinets planned for the sink-and-serving center.

Cabinets of the type shown in Figure 2 were planned for the cooperators in this study. When storage was planned for all articles assigned to these centers,* the following average dimensions were obtained:

| | |
|---|---|
| Average length of upper cabinets needed for every-day dishes | 41″ |
| Average length of upper cabinets needed for company dishes | 43″ |
| Average length of lower cabinet for food supplies and equipment | 44″ |
| Average length of sink unit, when planned as shown in Figure 2A | 10′0″ |
| Average length when planned as in Figure 2C | 10′4″ |

A cabinet planned for a combined sink-and-serving center would be difficult to incorporate in many kitchen arrangements because of its length. One possibility for shortening the unit is to store company dishes in a separate cabinet, or in a closet off the dining room. When company dishes were stored elsewhere, it was found that a sink unit of minimum length, or 8 feet 2 inches, of the type shown in Figure 2A, was adequate in the average case. An average length of 21 inches was found to be needed for the floor-to-ceiling cabinets planned to store only the company dishes.

Another possibility for shortening the sink unit is to let a drop leaf serve as part of one work surface and to plan a serving unit separate from the sink unit. The other end is the same as that shown in Figure 2. The total length of this cabinet is 6 feet 8 inches, exclusive of the drop leaf.

Figure 7 also shows the serving unit designed to go with the shortened sink unit. The storage space above and below the serving table provides for the materials remaining after the storage areas of the shortened sink unit have been assigned. A length of 32 inches suffices for the serving unit. It is planned as a single cabinet with a cut-back on a level with the sink rim. If a roller shade is used to close the upper part of the cabinet, the uppermost wide shelf serves for work counter and storage as well.

The heights of the working surfaces shown in Figures 2 and 7 are those suited to the needs of the average homemaker.† The floor of the sink is 32½ inches from the floor of the room.‡

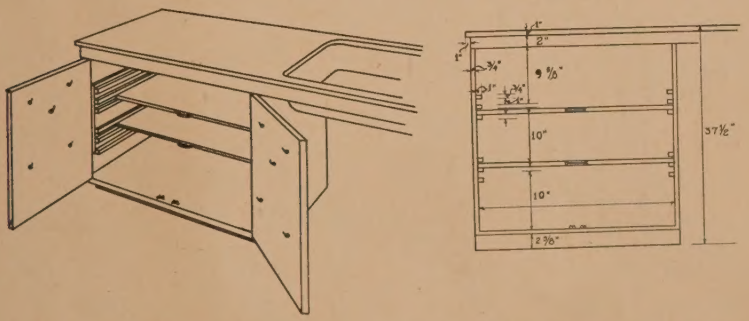



Figure 3. Lower cabinet at one side of sink. Designed for storage of kettles, saucepans, and other articles it is desirable to store near the sink. Cabinet has sliding shelves that can be adjusted as to distance apart. Shelves are made narrower than compartment, to provide room for utensils hung on doors.

* A detailed description of this procedure is given in Bulletin 356, pp. 64-66.

† See Oregon Station Bulletin 348, *Standards for Working-Surface Heights and Other Space Units of the Dwelling.*

‡ This is the height preferred by the average homemaker when the dishpan is placed in the sink, or when the sink bowl is used for washing dishes; and when a mixing table of the preferred height for beating, rolling, etc., is a unit of the kitchen built-ins.

### Mixing center

In addition to the working surfaces at either end of the sink, it is desirable that one surface be provided for processes requiring little or no water, such as beating, kneading, and rolling. These activities require a working surface about on a level with the floor of the sink.*

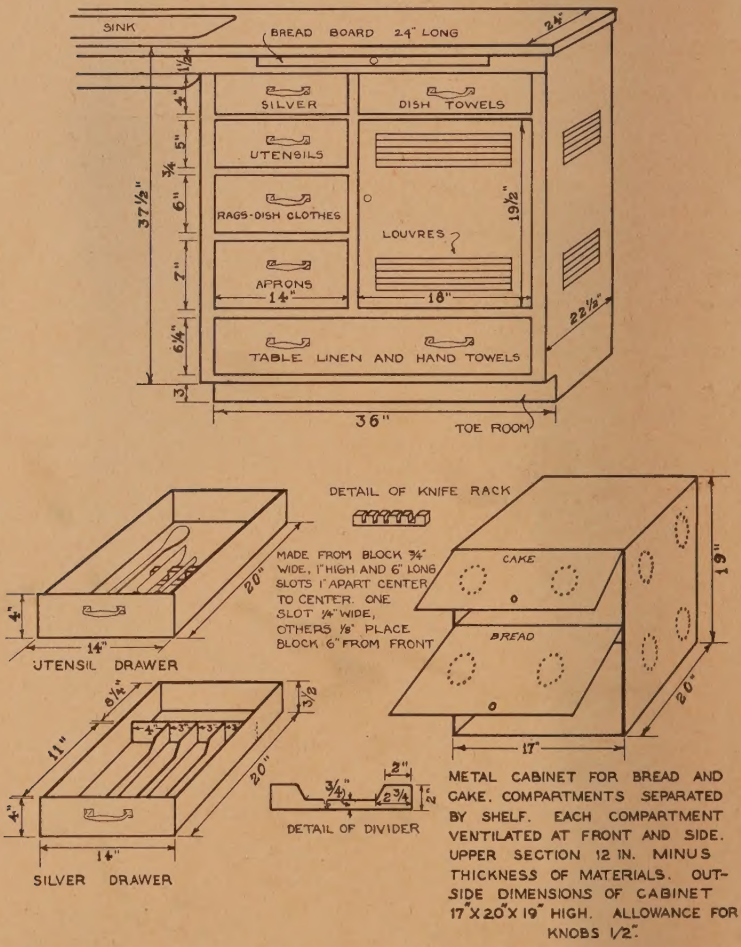



Figure 4. Dimensions of lower sink cabinet with drawers, illustrated by Figure 2, and allocation of available storage space.

* See Oregon Station Bulletin 348, *Standards for Working-Surface Heights and Other Space Units of the Dwelling.*

This working surface and adequate storage cabinets for the equipment and supplies used there comprise the mixing-table unit. Two plans were made for the storage required by each cooperator, one consisting of a lower cabinet, upper cabinet, and floor-to-ceiling cabinet, the other consisting only of a 36-inch lower cabinet and a floor-to-ceiling cabinet. A floor-to-ceiling cabinet was considered an essential part of the mixing-center ensemble, as an upper cabinet wide enough for the larger articles of equipment allocated to this center would interfere with vision and arm movement at the mixing table. These cabinets are illustrated by Figures 8 and 9.

Following are dimensions for these cabinets:

| | | |
|---|---|---|
| Plan A. | Average length of mixing table | 46 inches |
| | Average length of upper cabinet | 22 inches |
| | Minimum (and average) length of floor-to-ceiling cabinet | 18 inches |
| Plan B. | Length of mixing table | 36 inches |
| | Average inside length of floor-to-ceiling cabinet | 26 inches |

The length of the wall space required by the minimum-length mixing table and the floor-to-ceiling cabinet that goes with it (Plan B), is usually the shorter by 4 to 6 inches. A wall space of 62 inches is enough for this plan in three-fourths of the cases. The shallow drawers of the mixing table in Plan A, however, are very convenient for recipes and small articles.

### Stove center

The problem of what type of stove to plan for was discussed with the homemakers who assisted in this study. The majority favor a combination stove, but are divided as to whether it should be (1) a 6-hole wood stove with a 2- or 3-hole electric plate, (2) a 4-burner electric or gas stove with a 2-hole trash burner, or (3) a stove with both wood and electric ovens, four electric burners, and at least four holes in the wood range.

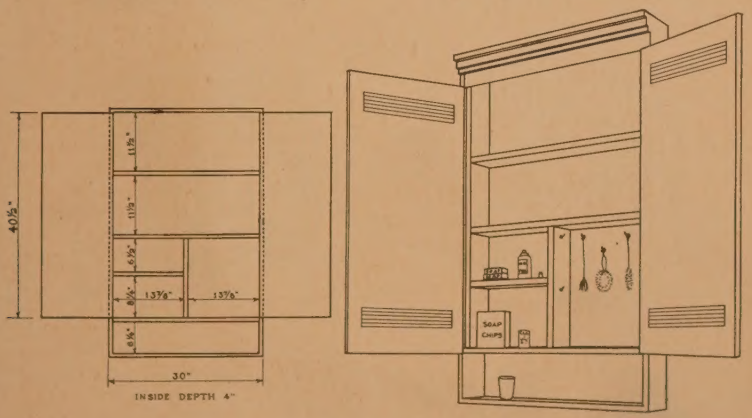



Figure 5. Cabinet above sink. For cleaning materials.

There are several reasons for these differences of opinion. Homemakers who prefer type one do not have many hired men to cook for, and desire the electric plate for getting the evening meal or other short-time processes. Those who prefer types two or three have more cooking to do in warm weather. In most cases the wood range is preferred as an economy measure, wood commonly being produced on farms in many sections of Oregon.

The kitchen wood box should hold a day's supply of wood and kindling. Figure 10 illustrates various types of wood boxes. A box holding a full

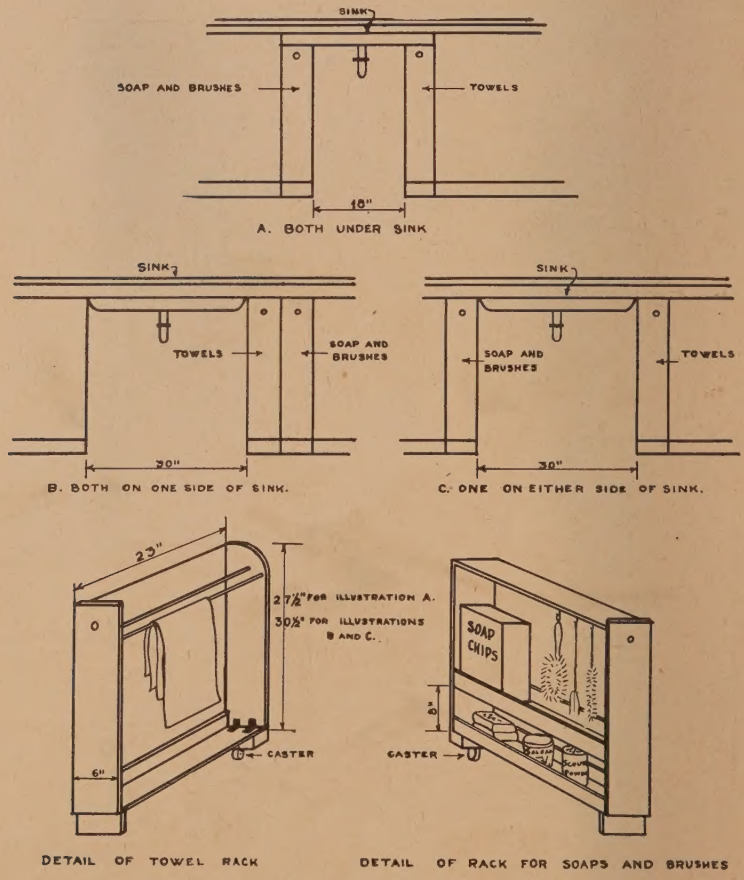



Figure 6. Racks for dish towels and cleaning materials.
(A) Both placed under the sink. (B) Both placed at one side of the sink. (C) One placed at either side of the sink.

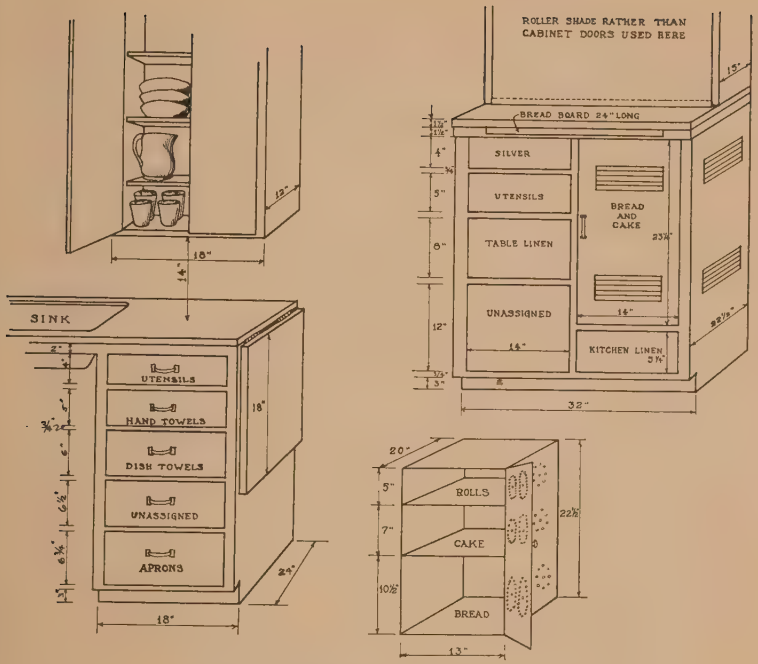
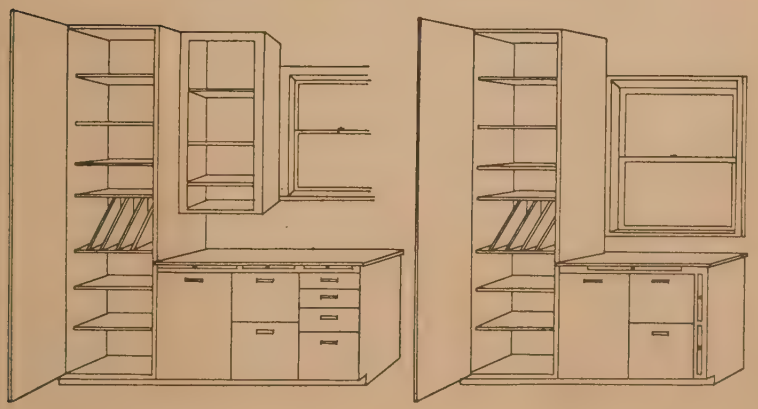



Figure 7. Two-unit sink and serving installation.



A. B.

Figure 8. Mixing-center ensembles.

Plan A. Consists of floor-to-ceiling storage cabinet, shallow upper cabinet, and long mixing table with drawers and bins below it. Plan B. Consists of floor-to-ceiling storage cabinet and minimum-length mixing table with bins below it.

day's supply and intended for wood stored parallel to the front edge needs to be long enough for two piles. This type is shown by Figure 10A. Figure 10B illustrates the storage of wood under a work counter, while Figure 10C is that of a box requiring only 17 inches of wall space; these last two types may be built with or without doors.

Figure 11 illustrates the various methods used for storing the articles, other than fuel, that were assigned to the stove center.

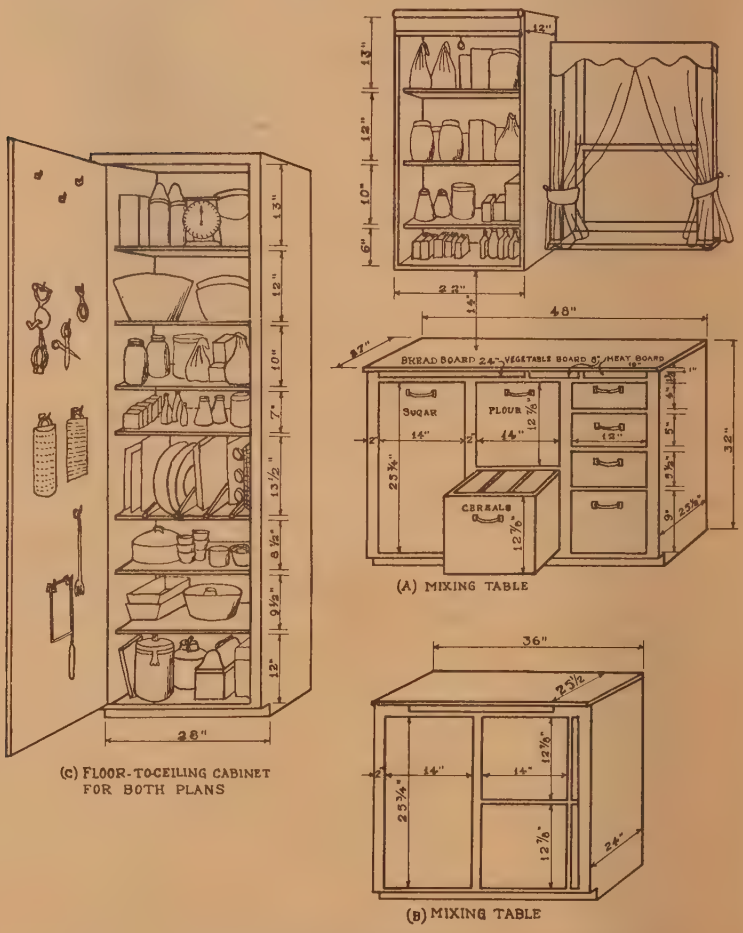



Figure 9. Dimensions and use of cabinets included in mixing-center plans. Detail of Figure 8.

In arranging for the storage of equipment and supplies at the stove center, wood storage was planned first, then the unused space above and below the wood compartment was assigned. Where this space provided for all of the material to be stored, it was equipped with hooks for articles that can be hung, a lid rack on the door, and shelves for the rest. Where this space was not large enough for all articles, it was equipped with shelves,

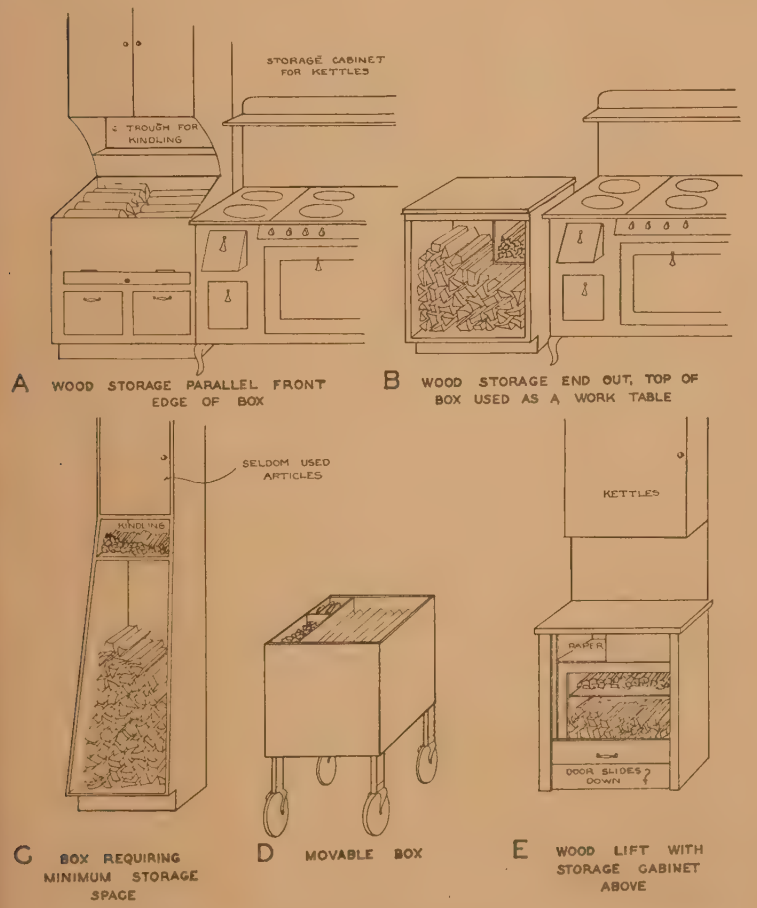

STORAGE CABINET FOR KETTLES
TROUGH FOR KINDLING
A WOOD STORAGE PARALLEL FRONT EDGE OF BOX
B WOOD STORAGE END OUT, TOP OF BOX USED AS A WORK TABLE
SELDOM USED ARTICLES
KINDLING
C BOX REQUIRING MINIMUM STORAGE SPACE
D MOVABLE BOX
KETTLES
PAPER
DOOR SLIDES DOWN
E WOOD LIFT WITH STORAGE CABINET ABOVE

Figure 10. Wood-box designs.

(A) Box with upper cabinet for utensil storage. Space between wood and upper cabinet for kindling. (B) Box under work counter. (C) Wood box or closet. Suitable for use where wall space is limited. (D) Box equipped with rubber tired wheels for convenience in moving through door for filling. (E) Wood lift. Door drops into basement. Top may be used for work table, and upper cabinet for utensils.

as in Figures 11A and 11D. For the heavy utensils and those that can be hung, there was planned a floor-to-ceiling cabinet of a type of construction permitting hooks to be placed anywhere on sides or back. The minimum inside length (side to side) measure of this cabinet is 15 inches and its front-to-back measure, 16 inches. It is illustrated by Figure 11B.

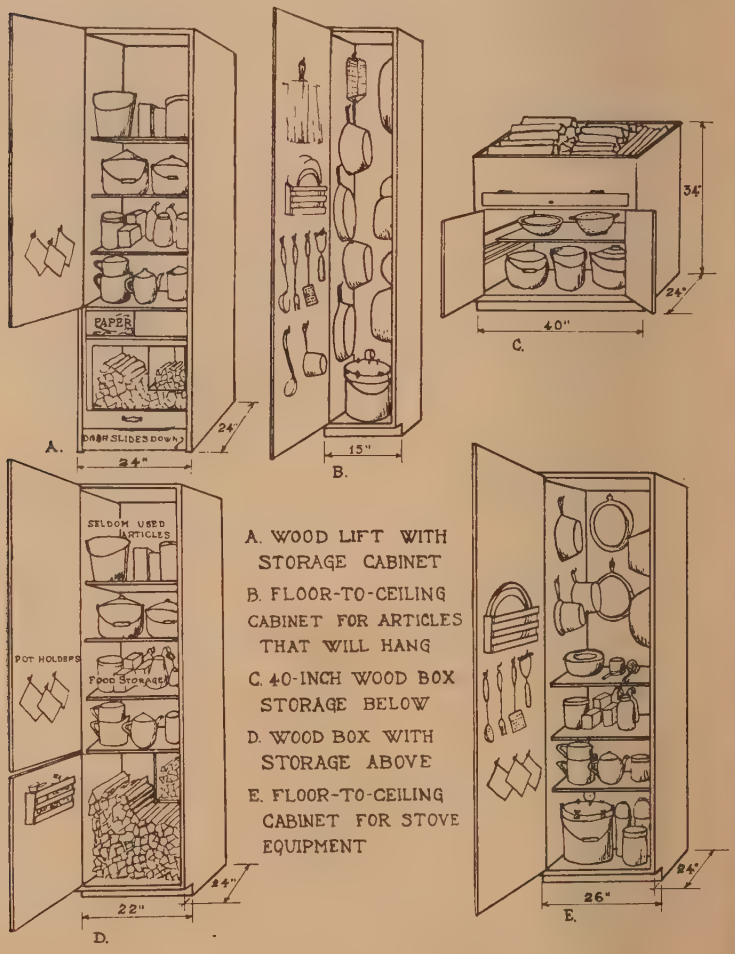



Figure 11. Cabinets used in stove-center plans.

(A) Wood lift with storage cabinet above it. (B) Floor-to-ceiling cabinet for articles that will hang. (C) 40-inch wood box with compartment below for kettles. (D) Cabinet for wood and for supplies and equipment requiring shelf room. (E) Cabinet for supplies and equipment requiring hanging space and shelf room.

Where no wood storage was needed a single floor-to-ceiling cabinet was planned for supplies and utensils. This has a section for articles that will hang, as well as shelves (Figure 11E). In cases where wood was used for the kitchen stove the space above the wood lift or wood box provided enough space for the kettles and supplies used at the stove center. (Figures 11A, D). If a floor-to-ceiling utensil cabinet is preferred (Figure 11B), it can be of the minimum length suitable for the purpose, which is 15 inches (inside measure).

### Mixing center and stove center combined

Often it pays to plan one floor-to-ceiling cabinet to store the utensils and packaged foods used at the mixing center as well as those used at the stove. An economical arrangement for combining these two centers consists of a mixing table 36 inches long with an upper cabinet of the same length and a floor-to-ceiling cabinet placed near both the mixing table and the range. For the average case included in the kitchen study, this cabinet needs to be 30 inches long (side-to-side measure). If no upper cabinet is desired for the mixing table, then the floor-to-ceiling cabinet needs to be 50 inches long.

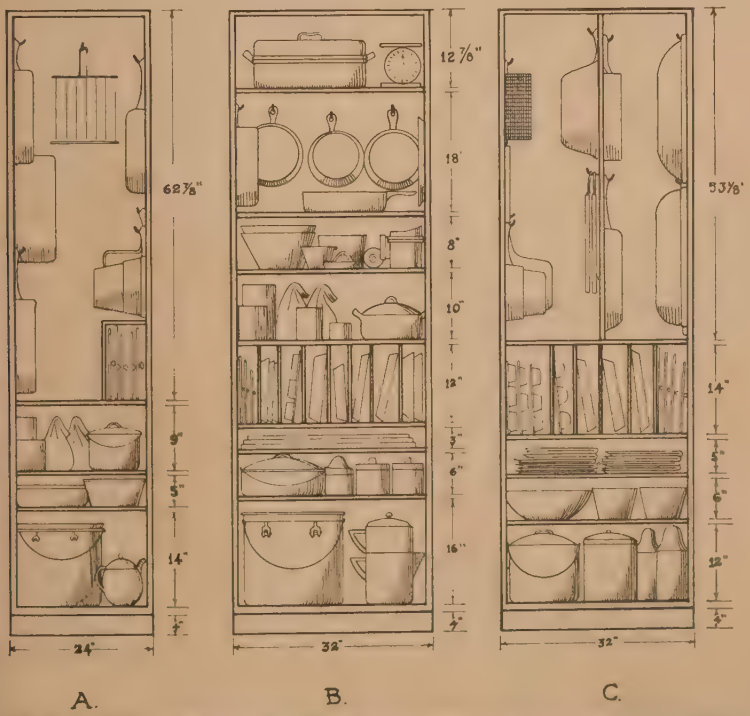



Figure 12. Floor-to-ceiling cabinets used when stove center and mixing center are combined. Small articles are hung on the door of the cabinet, as shown by Figure 11.

The interior arrangement of floor-to-ceiling cabinets designed for the combined mixing and stove center are shown in Figure 12.

### Draft cooler

The main points in the design of the draft cooler are shown in Figure 13. Unless one is sure of having a refrigerator and of operating it in winter as well as in summer, it pays to make a draft cooler large enough to hold all perishable foods. The floor-to-ceiling draft coolers planned for cooperators varied little in size. The largest was 18 by 30 inches or 24 by 24 inches (outside measure), but a cooler of this size would be used to at least four-fifths capacity by 13 of the 14 cooperators.

## THE FAMILY CENTER

As stated in a foregoing paragraph, satisfactory provision can be made in one space for dining, child's play, consulting recipes, writing and account keeping, sorting and piling garments while ironing, and certain sewing processes.

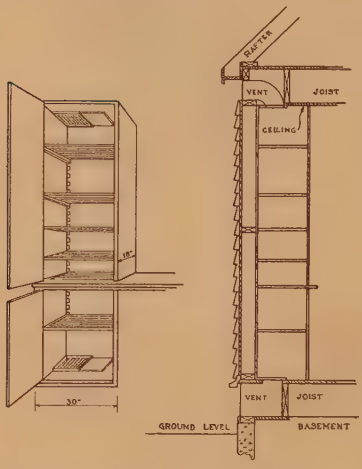



Figure 13. Draft cooler. *Left*: Perspective. *Right*: Cross section.

Two vents are essential. The lower one should be at or below the floor level, while the upper one should be at or above ceiling level. Large vents are more effective than small ones. Vents should be covered with fine-mesh copper screening which can be removed for cleaning. They should also be fitted with some arrangement for closing that can be operated from the inside.

Shelves should be removable and adjustable as to distances apart. The door should fit tightly, to prevent drafts in the kitchen. The interior finish of the cooler should be readily cleanable.

### Location

This center should have a light, well-ventilated location, preferably with an outdoor view. An alcove is usually not so desirable as an open corner unless the location of the alcove permits the table to extend into the kitchen when necessary.

### Equipment

The equipment of this center will, of course, depend on the par-

Figure 14. Convenient arrangement for ironing center.

ticular uses it is to serve. A table is always needed. If meals are served in the kitchen, then the dining table will answer all purposes; if not, a table 24 by 30 inches will usually suffice for other uses of the area.

The table top should be easily cleaned and not easily marred. The table should be placed in a position where little or no moving is required, and it should be of such size that extension is not usually necessary.

The space allowed for this area should permit at least two chairs (for between-meal use) in positions where they will not be in the way of kitchen work. It is best to make the area large enough to permit the use of chairs by all persons regularly seated at the meal table. The next best arrangement is a bench along the wall and chairs for the other side of the table. Should a fixed bench and table be installed, the edge of the bench should be on a vertical line with the edge of the table, and the table leg or other support should be set in from the edge at least fifteen inches.

Storage space should be provided near the table for writing materials, recipes (unless stored at the mixing table), books on homemaking, and a drawer for children's "treasures."

The ironing board should be located near the table, in order that the latter may be used in sorting and piling garments. A hook should be placed conveniently near the board where newly ironed garments may be hung on hangers. There should be also a rack for drying folded articles. The wall rack with arms that spread fan-wise is a convenient type.

A convenient arrangement of table, built-in ironing board, garment hook, and drying rack is suggested by Figure 14.

### Dimensions

Whether used for meals or not, the space allowed for the family center should be ample. Desirable dimensions for dining areas, determined from measurements made while persons were taking their seats and while eating meals, are given in Figure 15. The tables were planned for six persons.

A satisfactory size for the ironing board is 14 by 60 inches. There should be at least 6 inches of free space at the back and 12 inches at the end.

## KITCHEN FLOOR PLANS

### Room-planning problems studied

After the various center plans were made, as described in foregoing sections, plans were developed to provide the wall and floor space required for the kitchen of the average cooperator. In making these room plans the aim was to produce step-saving kitchens, as small as they can be made, and yet care for all needs. The plans were developed in sufficient variety to afford a choice for the home builder.

Major factors in planning kitchens for the group selected for study were the type of fuel used for cooking and the use of the kitchen for serving meals. Four room-planning problems were chosen for study, varying as follows with respect to these two factors:

1. Wood and electricity used for cooking; dining area provided.
2. Electricity only used for cooking; dining area provided.
3. Wood and electricity used for cooking; dining area not provided.
4. Electricity only used for cooking; dining area not provided.

In arriving at solutions to the first problem, all possible sequences of equipment, doors, and chimney were tested (within the limits of the standards set up); dimensions were determined; and travel estimates were made.

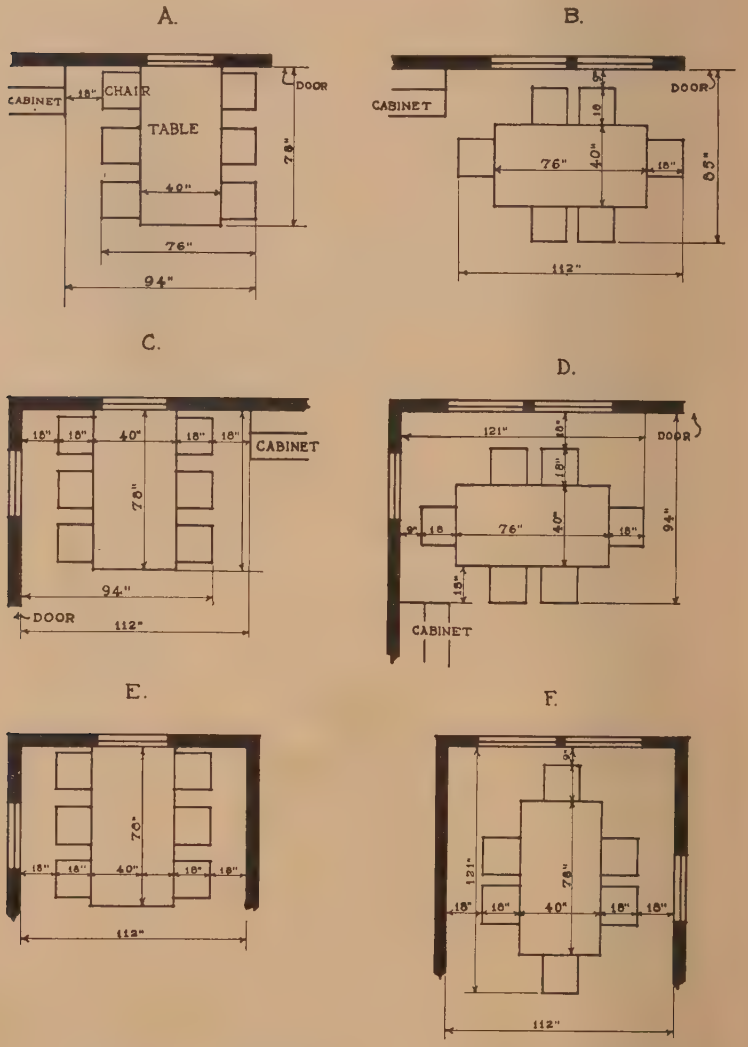



Figure 15. Dimensions of dining areas. Given for one-wall, two-wall, and three-wall areas, and for seating arrangements utilizing two opposite sides, and all four sides, of the table, respectively.

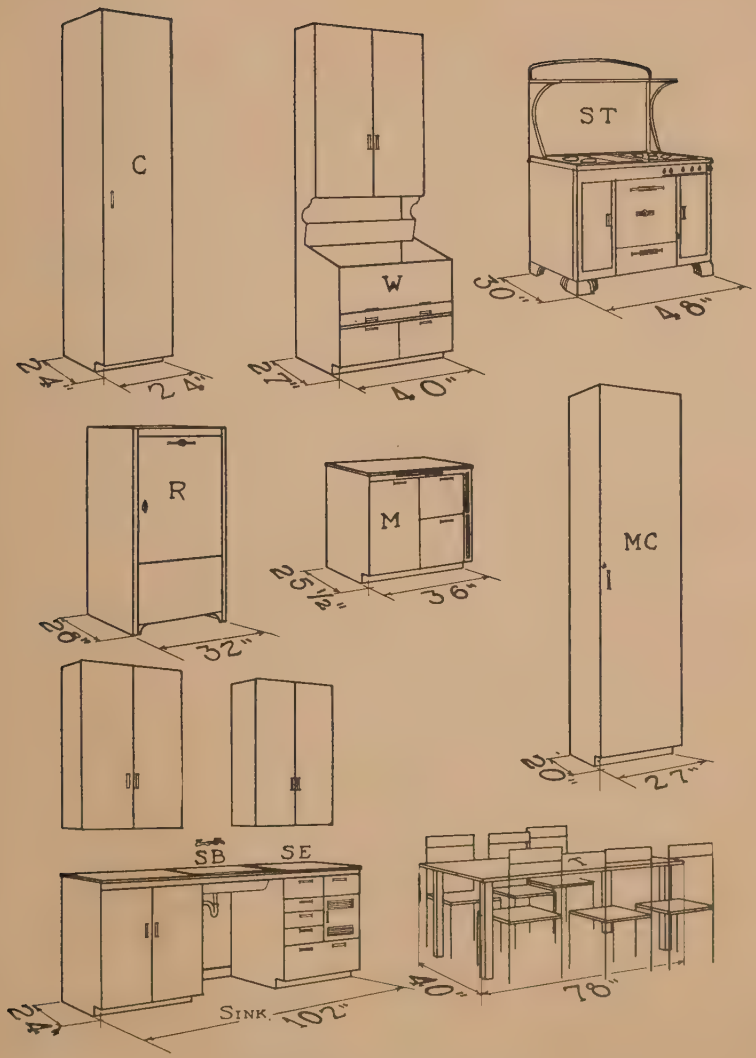



Figure 16. Equipment used in kitchens planned for Problem One, and shown in Figures 17 to 21 inclusive.

C—draft cooler. W—wood box with cabinet above it for equipment and supplies used at the stove. ST—combination cook stove, using wood or coal, and electricity or gas. R—mechanical refrigerator. M—mixing table with bins below it. MC—storage cabinet for utensils and packaged supplies used at the mixing table. SB—sink bowl. SE—serving end of sink unit. T—meal table.

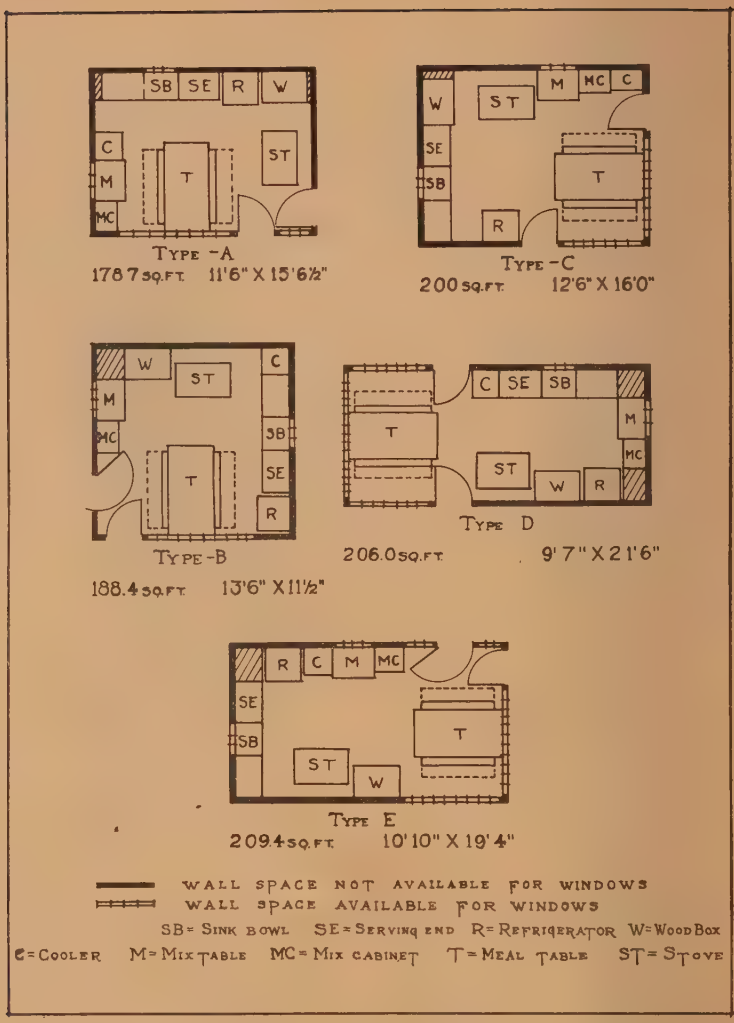



Figure 17. Dimensions and arrangement of least-area kitchens of each arrangement type, with equipment shown in Figure 16, and with sequence of working equipment unbroken by doors. Shading indicates areas that might be used for built-ins or equipment in addition to or as an extension of those used as the basis for planning the kitchens, or they indicate where change from the rectangular form of the room might be made. Double lines indicate wall space available for windows.

(A) Meal table occupies space between pieces of working equipment. Area, 178.7 square feet; travel estimate, 161.7 miles per year. (B) Meal table separate from working area on one side; both doors on one side of meal table. Area, 188.4 square feet; travel estimate, 166.6 miles. (C) Meal table in corner; passage between meal table and working area. Area 200.0 square feet; travel estimate, 173.4 miles. (D) Meal table occupies one end of kitchen; passage between meal table and working area. Area, 206.0 square feet; travel estimate, 178.1 miles. (E) Meal table occupies one end of kitchen; both doors on one side of meal table. Area, 209.4 square feet; travel estimate, 172.6 miles.

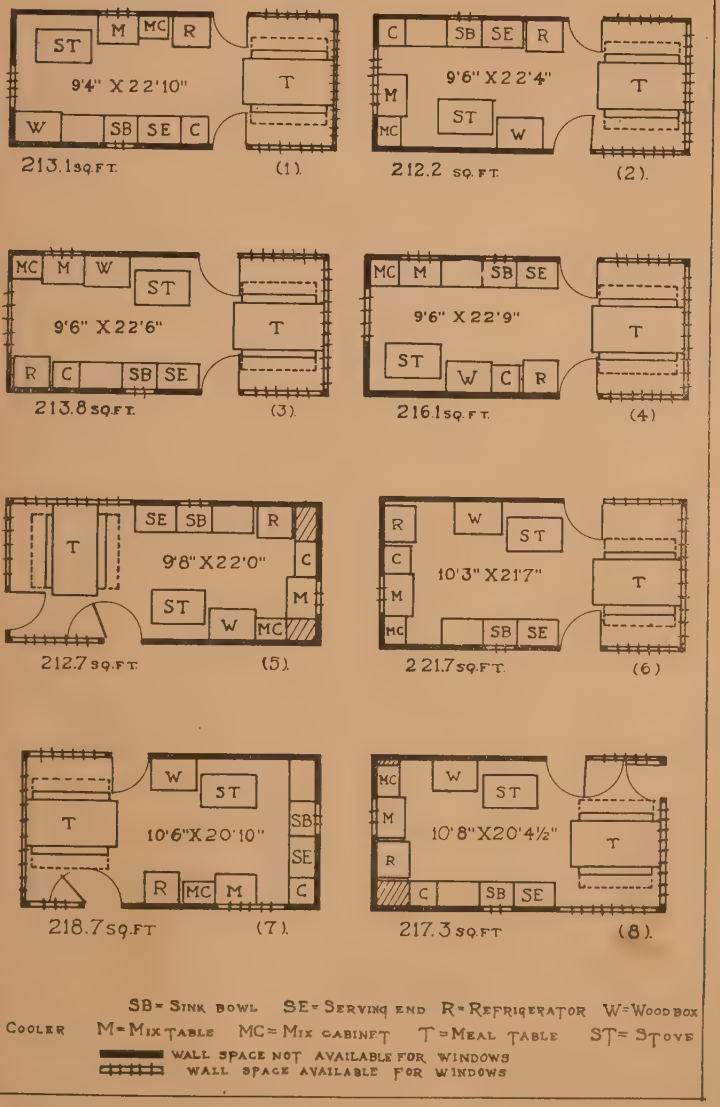



Figure 18. Selected kitchen plans representing further solutions of Problem One, arranged in order of shortest dimension. See Figure 16 for description of equipment.
Travel estimates are as follows:
(1) 189.7 mi. (2) 183.8 mi. (3) 181.0 mi. (4) 185.6 mi.
(5) 172.8 mi. (6) 182.8 mi. (7) 215.9 mi. (8) 172.6 mi.

The kinds and sizes of cabinets and other equipment in the kitchen plans are those found to be needed for the average cooperator in the study.

**Convenience in kitchen arrangement**

The bases for judging the convenience of proposed kitchen arrangements were estimates made of the travel that would be required of a worker in doing routine kitchen work in a year's time.

The following rule was found to be helpful in producing low-mileage floor plans: *Arrange the kitchen so that the sum of the distances between range, sink, and meal table (or dining-room door) is as small as possible.*

**Floor plans developed**

Problem One: Equipment includes wood-and-electric range, and meal table (Figure 16).

Five types of arrangement were distinguished (Figure 17), varying in the relative position of meal table and working area. In Type A the meal table occupies the center of the open space enclosed by the pieces of working equipment when they form a "U". In Types B and C the working area is partly separated from the dining area, or family center, while in Types D and E the separation is complete. Generally speaking, the areas of the minimum-sized kitchens of the various types vary in proportion to the degree of separation of the working and family centers. The area of the smallest kitchen of each type, when the sequence of working equipment is unbroken by doors, is as follows: Type A, 178.7 square feet; Type B, 188.4 square feet; Type C, 200.0 square feet; Type D, 206.0 square feet; Type E, 209.4 square feet.

Of the various solutions developed for Problem One, the kitchen with the lowest travel estimate would require 162 miles of walking per year.

No kitchen arrangement developed is distinctly superior to the other arrangements, either in area or travel estimates. Rather, there are various low-area and low-mileage arrangements differing principally in the convenience of the meal table, or "family", center.

Thirty-two additional floor plans accommodating the equipment shown in Figure 16 are given in Figures 18, 19, 20, and 21.

Problem Two: Equipment includes electric range and meal table. Storage for stove and mixing centers was combined.

In Figure 23 there are included eight floor plans that provide for the equipment shown in Figure 22. The smallest kitchen developed contains 153.0 square feet. The smallest kitchen of each arrangement type, when an electric range was used, is from 20 to 26 square feet smaller than the smallest kitchen of the corresponding type that was equipped with a combination wood-and-electric range. Travel estimates for the low-area kitchens were approximately 155 miles per year.

Problem Three: Equipment was the same as for Problem One except that a utility or work table, 24 by 30 inches, with one chair was substituted for the meal table and six chairs.

Six of the floor plans providing for this equipment are shown in Figure 24. The smallest kitchen developed has an area of 148.2 square feet.

Problem Four: Equipment was the same as for Problem Two except for the substitution of the utility table for the meal table. It is planned for

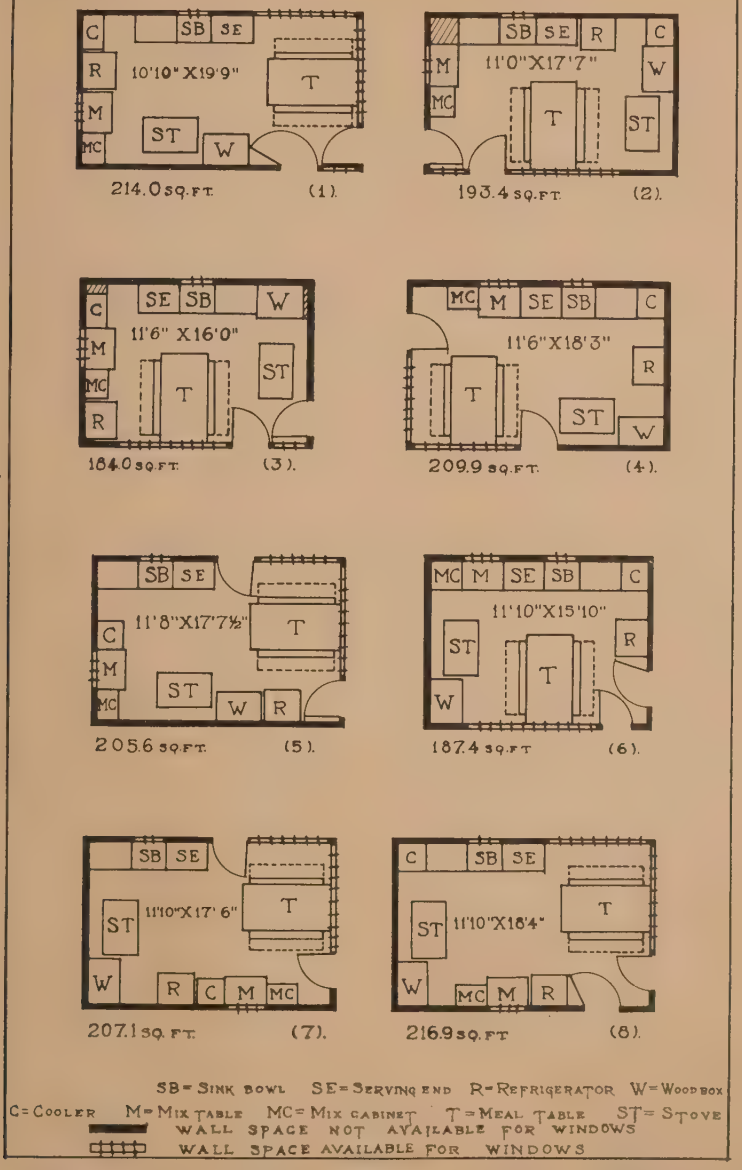



Figure 19. Continuation of Figure 18. For description of equipment see Figure 16. Travel estimates are as follows:

(1) 176.2 mi. (2) 170.3 mi. (3) 161.7 mi. (4) 186.2 mi.
(5) 173.4 mi. (6) 173.5 mi. (7) 182.6 mi. (8) 177.4 mi.

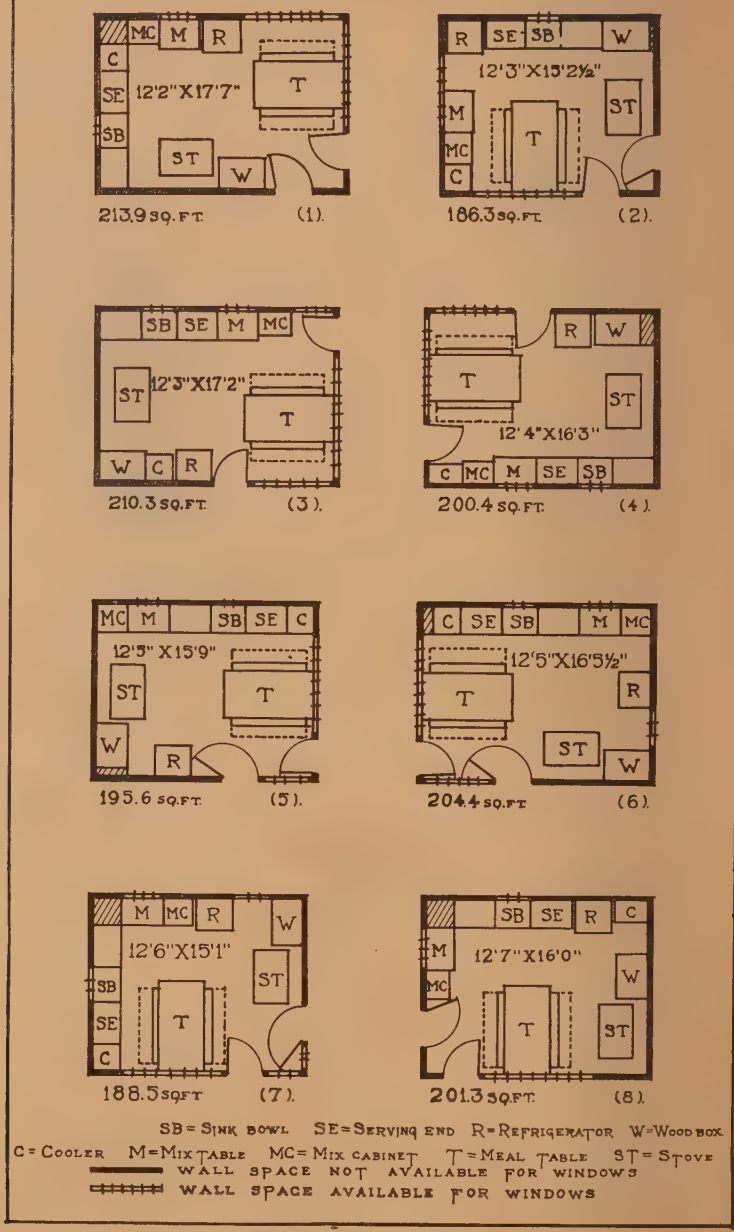

MC M R C SE SB 12'2"X17'7" T ST W
213.9 SQ. FT. (1).
R SE SB W 12'3"X15'2½" M MC C T ST
186.3 SQ. FT. (2).
SB SE M MC ST 12'3"X17'2" T W C R
210.3 SQ. FT. (3).
R W T ST 12'4"X16'3" C MC M SE SB
200.4 SQ. FT. (4).
MC M SB SE C 12'3" X15'9" ST T W R
195.6 SQ. FT. (5).
C SE SB M MC 12'5"X16'5½" T R ST W
204.4 SQ. FT. (6).
M MC R W 12'6"X15'1" SB SE C T ST
188.5 SQ. FT. (7).
SB SE R C M MC 12'7"X16'0" T W ST
201.3 SQ. FT. (8).
SB = SINK BOWL SE = SERVING END R = REFRIGERATOR W = WOOD BOX
C = COOLER M = MIX TABLE MC = MIX CABINET T = MEAL TABLE ST = STOVE
WALL SPACE NOT AVAILABLE FOR WINDOWS
WALL SPACE AVAILABLE FOR WINDOWS

Figure 20. Continuation of Figure 18. For description of equipment see Figure 16. Travel estimates are as follows:

(1) 187.5 mi. (2) 175.1 mi. (3) 190.4 mi. (4) 181.5 mi.
(5) 168.4 mi. (6) 172.5 mi. (7) 176.8 mi. (8) 179.7 mi.

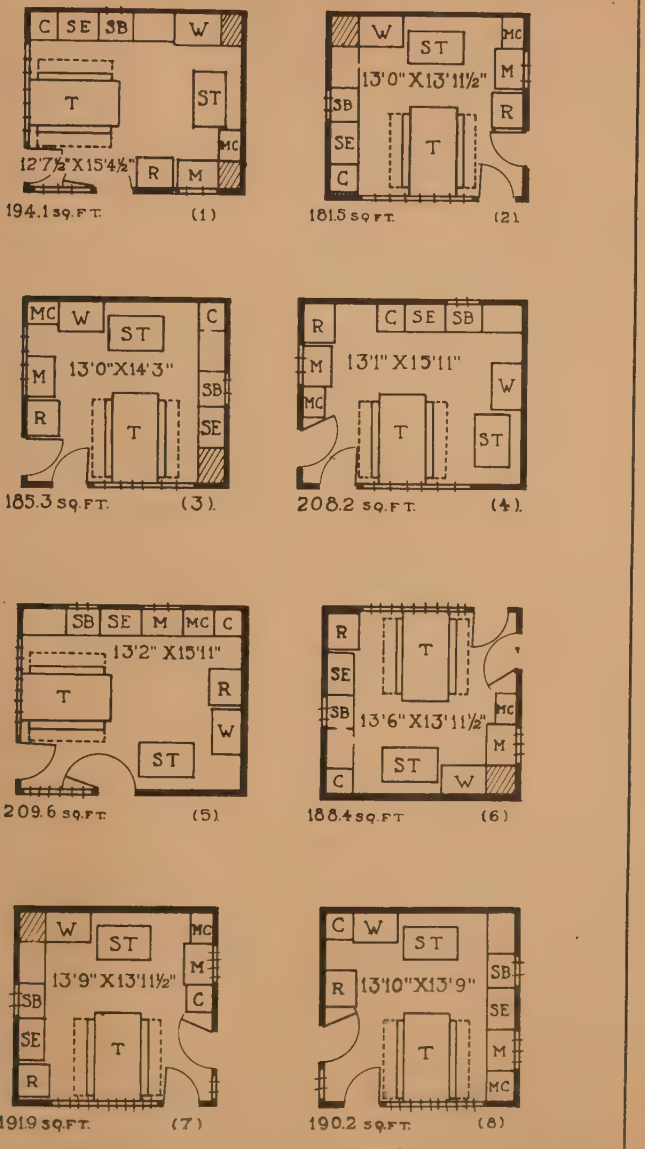



Figure 21. Continuation of Figure 18. For description of equipment see Figure 16. Travel estimates are as follows:

(1) 168.7 mi. (2) 169.4 mi. (3) 168.4 mi. (4) 182.8 mi.
(5) 178.5 mi. (6) 167.2 mi. (7) 170.9 mi. (8) 183.3 mi.

the situation where no meals are served in the kitchen and where electricity (or gas) is used for all cooking.

Six plans for this type of kitchen are shown in Figure 25. The smallest kitchen developed has an area of 115.1 square feet. The narrowest kitchens were found to be lowest in area.

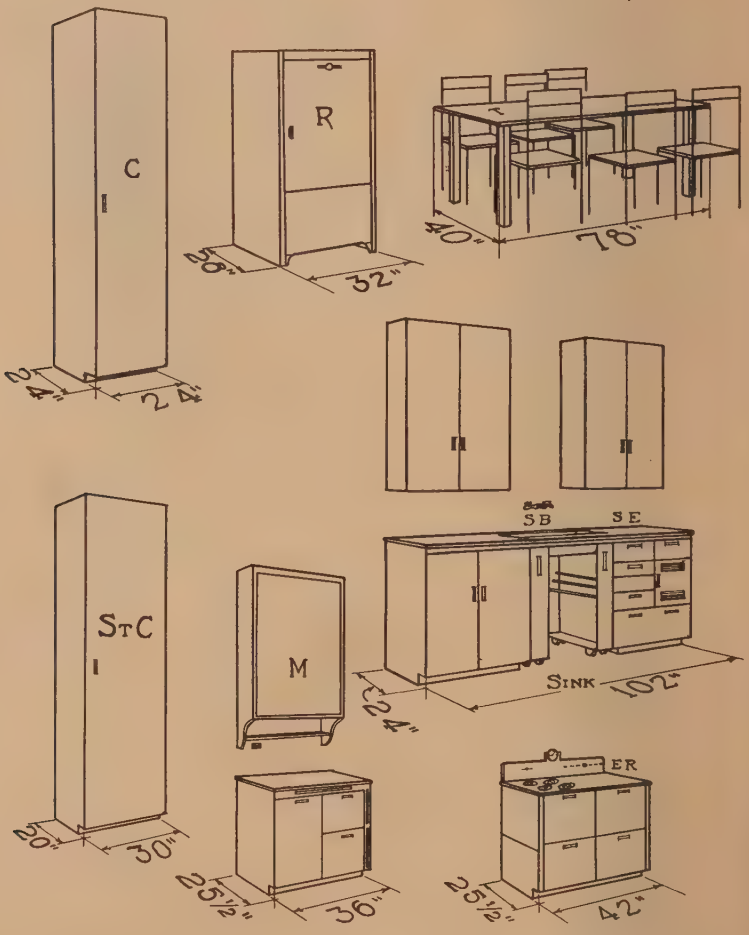



Figure 22. Equipment used in kitchens planned for Problem Two, and shown in Figure 23. C—draft cooler. R—mechanical refrigerator. T—meal table. SB—sink bowl. StC—storage cabinet for utensils and packaged supplies used at the mixing and stove centers. M—mixing table with bins below it and with a storage cabinet above it. Upper cabinet closed by roller shade. ER—electric or gas range.

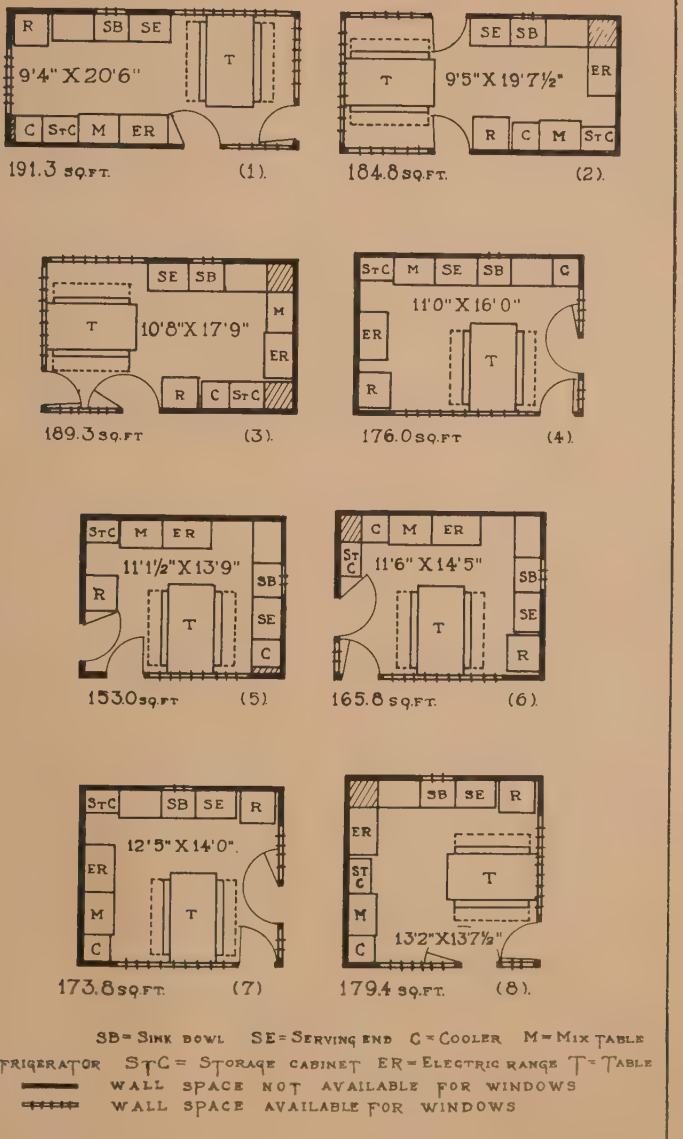



Figure 23. Selected kitchen plans representing solutions of Problem Two. For description of equipment see Figure 22. Shading indicates areas that might be used for built-ins or equipment in addition to or as an extension of those used as the basis for planning the kitchens, or they indicate where change from the rectangular form of the room might be made. Double lines indicate wall space available for windows.
Travel estimates for the various kitchen plans are as follows:
(1) 163.9 mi. (2) 158.5 mi. (3) 152.3 mi. (4) 167.2 mi.
(5) 152.4 mi. (6) 155.4 mi. (7) 162.5 mi. (8) 157.0 mi.

## KITCHEN-PLANNING SUGGESTIONS FOR THE INDIVIDUAL HOMEMAKER

### Importance of considering individual requirements

In planning a specific kitchen, whether new or remodelled, it will be necessary usually to modify the standards for kitchen planning that are given in this circular. In doing so, it is desirable for the individual home-

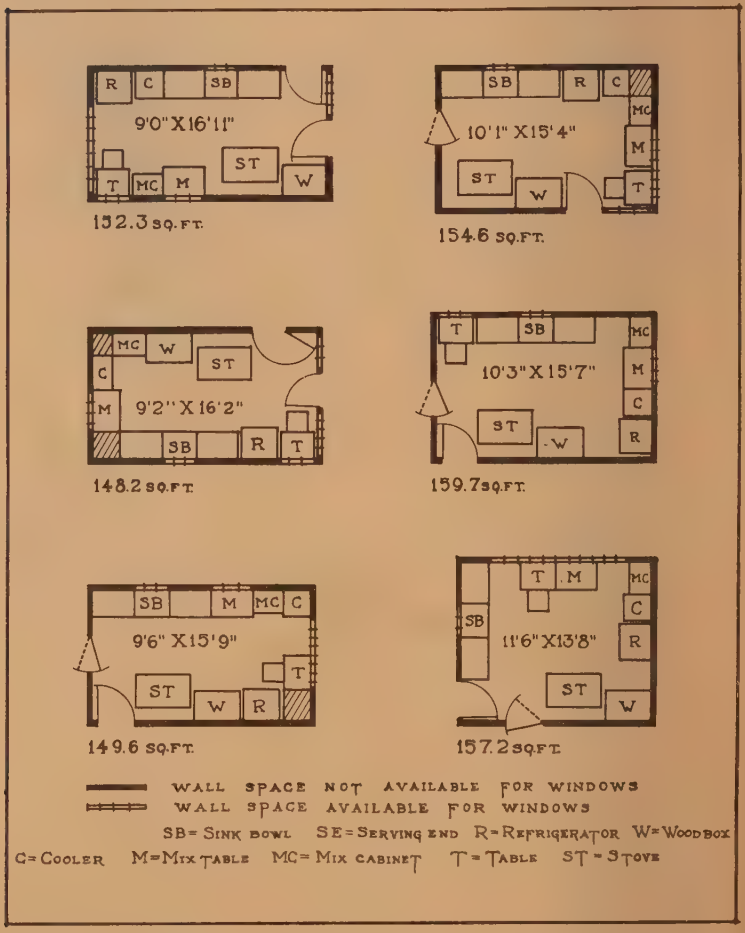



Figure 24. Selected kitchen plans representing solutions of Problem Three. Equipment is identical with that shown in Figure 16, except that the meal table is omitted, and a table 24 by 30 inches, with one chair, is added.

maker to give her requirements as careful consideration as was given by the investigators to the requirements of cooperators in the study. This process takes considerable time, but the time spent in planning is short compared with the time saved in cooking and washing dishes in an intelligently planned kitchen.

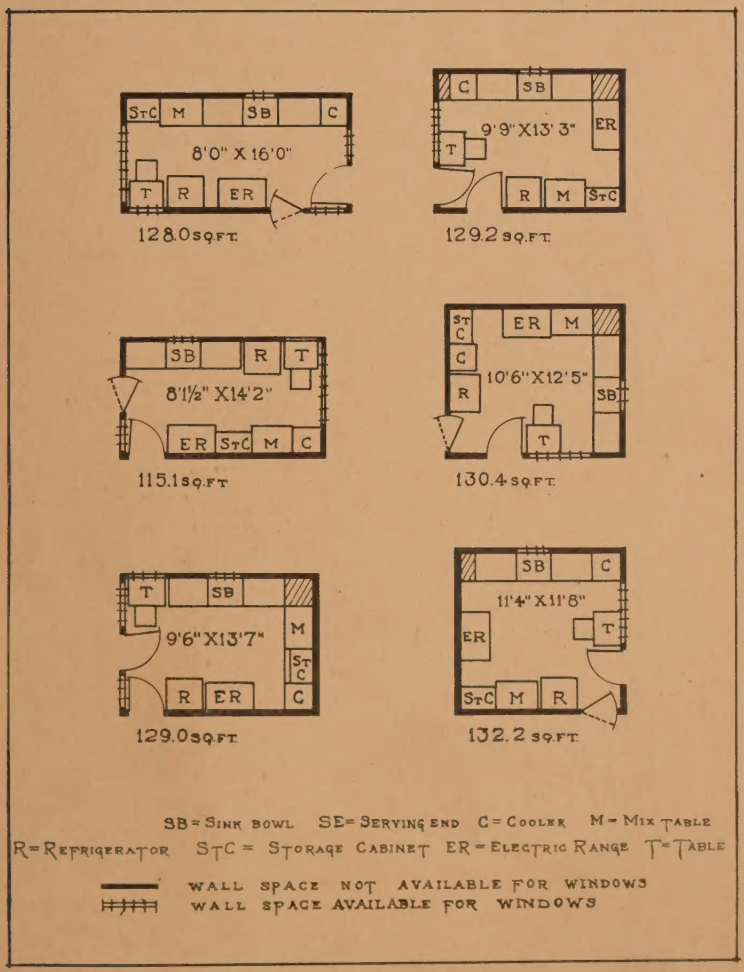
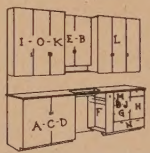
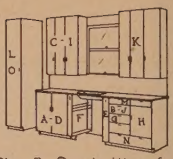



Figure 25. Selected kitchen plans representing solutions of Problem Four. Equipment used is identical with that shown in Figure 22, except that the meal table is omitted, and a table 24″ x 30″, with one chair, is added.

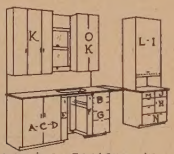
## A. Sink and Serving Centers



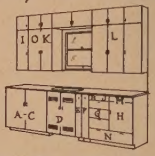

Plan 1. One built-in for sink and serving centers. No window above sink.




Plan 2. One built-in for sink and serving centers, except company dishes.

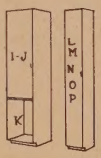



Plan 3. Sink and serving centers in separate built-ins. Everyday dishes stored at sink.

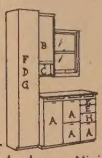



Plan 4. One built-in for sink and serving centers. Window above sink.

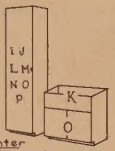
## B. Mixing and Stove Centers




Stove Center
Plan 1. Two floor-to-ceiling cabinets.

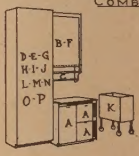



Mixing Center
Plan 1. Long Mixing table. Short upper cabinet. Floor-to-ceiling cabinet.

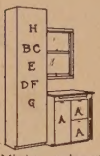



Stove Center
Plan 2. Floor-to-ceiling cabinet and wood box.

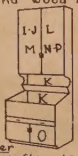
Stove and Mixing Centers Combined




Plan 1. Minimum-length mixing table. Upper cabinet. Floor-to-ceiling cabinet.




Mixing Center
Plan 2. Minimum-length mixing table. No upper cabinet. Floor-to-ceiling cabinet.




Stove Center
Plan 3. One floor-to-ceiling cabinet.

Figure 26. Suggested Ways of Planning Kitchen Built-ins.

(Capital letters represent groups of articles assigned for storage.)

Meaning of capital letters:

### Sink Center

A. Kettles, strainers
B. Knives, other small utensils
C. Food supplies
D. Dishpans
E. Soap, brushes
F. Towels in use (placed near range in some plans)
G. Supply of towels, dishcloths

### Serving Center

H. Bread, cake
I. Ready-to-eat foods
J. Serving utensils
K. Everyday dishes
L. Company dishes
M. Silver
N. Table linen
O. Containers for flowers

### Mixing Center

A. Sugar, flour, bulk cereals
B. Packaged groceries used in made dishes
C. Spices, flavorings
D. Mixing bowls, pans
E. Knives, spoons, etc.
F. Measuring cups, other small utensils that cannot be hung
G. Small utensils that can be hung
H. Recipes

### Stove Center

I. Packaged cereals, coffee and tea
J. Small utensils that can not be hung
K. Stove wood, kindling
L. Ladles, etc., that hang
M. Coffee pot, tea pot
N. Skillets, etc., that hang
O. Large utensils requiring shelf space
P. Lids

**Points to which consideration should be given**

Following is a list of the major items that should be considered by the individual homemaker in planning or remodelling her kitchen.

1. Adequate work space, considering the kind and amount of work done in the kitchen.
2. Adequate storage space for articles it is desirable to keep in the kitchen. "Adequate" implies (1) enough but not too much space, (2) suitable proportions, and (3) convenient arrangement.
3. Floor and wall space for the range and refrigerator in the sizes desired.
4. Facilities for reducing routine work and increasing comfort, such as water piped in, sewage piped out, lift provided for wood in basement, chute for laundry.
5. Floor areas and table heights that permit the worker to move freely and to maintain good posture.
6. Window space adequate for lighting surfaces and interiors of cabinets.
7. Windows where views are wanted.
8. A room arrangement that permits routine work to be done with the least possible amount of walking and that segregates the working space from the family center; also one that conforms to architectural limitations, in room dimensions, in the placement of doors and chimney, and in the placement and type of windows.
9. Artificial light adequate for surfaces and interiors of cabinets.
10. Electric wiring that permits use of appliances where most convenient.

**How to determine heights of working surfaces**

The best way for the homemaker to decide what are the best heights for her sink, mixing table, and ironing board is to go through the motions of washing dishes, beating eggs, rolling out pastry, kneading bread, and ironing a garment, raising and lowering the height of the surface she is testing until she finds the height that suits her best.

It is well to start with heights suited to the average woman; 32½ inches from the floor of the room for the floor of the sink bowl, 32 inches for the mixing table, 33½ inches for the pastry board, and 32½ inches for the ironing board.

The test may be done at a table, using piled-up boards or bricks on the table top to raise the surface, or under one's feet to lower the surface.

**How to plan storage**

A thorough-going consideration of requirements compels the homemaker to decide before her cabinets are built just how she will use each shelf, drawer, and bin. If this is done intelligently, her completed kitchen will be easy to keep in order, and she will work in it with a feeling of satisfaction rather than irritation.

Steps in the planning of kitchen storage are these:

1. Make a list of all articles to be stored in the kitchen. Add articles you expect to get. Assign each one to a center, or mark "unassigned" or "seldom used."

2. Make sketches of the equipment you expect to have or might have, considering the wall space available.
3. Decide on a tentative assignment of articles to be stored. See Figure 26, Suggested Ways of Planning Built-ins.
4. Plan the use you would make of the storage above and below working surfaces of minimum length, or of the built-ins that would fit best in the wall space available.
5. Determine what to do with materials in excess of those that can be stored in these cabinets.

**How to plan a step-saving room arrangement**

1. Draw to scale the various pieces of equipment you expect to have in your kitchen, including chairs. Make quarter-circles for doors and door swing. Cut out the pieces. Squared paper is convenient to use for this purpose.
2. From the room plans shown in Figures 17 to 25 select the one that most nearly suits your purpose.
3. Arrange your cut-outs in the manner suggested by the chosen illustration. Be sure to allow adequate space behind and at the sides of a wood-burning range, as well as floor space to move about freely. (Minimum dimensions of free floor areas are listed on the last page of this circular.) Locate possible space for windows, and stop to consider whether you will get sufficient light and the view you want. Alter the arrangement until you have made the best possible use of space.

## MINIMUM DIMENSIONS OF FREE FLOOR AREAS

Width of major passage, as between doors or main work centers: 30 inches.

Width of passage to wood box: 24 inches.

Width of passage between occupied chair or corner of table and object of more than elbow height: 18 inches. Of less than elbow height: 15 inches.

Width of passage past a major activity area, as sink, stove, or mixing table: 36 inches. This allows 21 inches for worker and 15 inches for person passing.

Depth of space for person to stand while working at sink, mixing center, or cooler: 27 inches.

Depth of space before refrigerator: 32 inches. This is required for door swing plus safety margin of 2 inches.

Length of space at side of sink: To permit two persons to work side by side, the distance between either side of the sink and a turn in the work counter should be at least 18 inches at the counter level and 24 inches at elbow height.

Depth of space between two main centers (stove, sink bowl, mixing table) directly opposite each other: The minimum distance between front edges of working surfaces should be 48 inches.

Depth of space in front of stove: 36 inches. This allows passage in front of open oven door.

Deight of space in front of wood box, if adjacent to high article, as refrigerator: 24 inches. If next to stove and at right angles to it, 15 inches space was allowed between them, if the one overlapped the other by less than 10 inches, 18 inches space if they overlapped from 10 inches to 20 inches, and 21 inches space if they overlapped 20 inches or more.

Minimum door swing: 90 degrees. Margin of safety beyond door width: 2 inches.